ANNUAL REPORT FY13

HABITAT ASSESSMENT FUNDED RESEARCH

Project Title: Evaluating the use of acoustic bottom typing to inform bottom trawl survey catchability models for snow crab in the eastern Bering Sea.

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Principal Investigators:

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Goals:

The object of this project is to improve Bering Sea snow crab (*Chionoecetes* opilio) stock assessments by quantifying seabed-related effects on survey-trawl estimates of abundance. A previous study (Somerton *et al.*, 2013) showed that direct measurements of sediment texture that were broadly extrapolated to the trawl-survey stations improved the fit of a trawl-efficiency model and changed the Allowable Catch Limit for the stock (Turnock, 2010). This study will determine if indices of sea-bottom type based on acoustic data collected at each snow crab sampling station are more informative for this purpose.

Approach:

In general, this project has two major work elements. The first step is to process archived acoustic data to obtain a quantitative characterization of seafloor properties at trawl-survey stations, using state of the art software. The next step is to estimate trawl efficiency with a size- and sex-specific model that includes the acoustic seabed characteristics. A determination whether these results are more informative for stock assessment than those obtained in the previous study (Somerton *et al.*, 2013) will be based on the amount of spatial variation in the snow crab efficiency model that is explained by the two kinds of sediment information. More specific information about the approach is provided in the project proposal and the published results of the previous study.

Work Completed:

- Obtained beta QTC IMPACT12 software from Quester Tangent Corporation just prior to the closing of their marine division.
- Contracted with a former QTC senior scientist and the lead software developer to adapt QTC IMPACT12 software for use with ES-60 data.
- Hired experienced contractor to process acoustic data. Provided formal training in use of QTC IMPACT12 software. Extended contract to compensate for partial government shutdown.
- Assembled 130 GB raw ES-60 acoustic data from the 2009 EBS trawl survey and imported it into QTC IMPACT12 software.
- Acoustic data processing and documentation work is underway and on schedule for completion by 31 January. Progress to date includes:
    - Completed a general assessment of acoustic data quality;
    - Corrected raw data for a systematic ping-indexed bias (Triangle Wave Distortion);
    - Performed software debugging / feature enhancements in collaboration with the developer (ongoing);
    - Completed bottom picks and segmented the acoustic data for most of the 284 trawl-survey stations with snow crab catches.

Applications:

Pending.

Publications/Presentations/Webpages:

Pending.

References:

Somerton, D. A., K. Weinberg, and S. Goodman. 2013. Catchability of snow crab (*Chionoectetes* opilio) by the eastern Bering Sea bottom trawl survey estimated using a catch comparison experiment. Can. J. Fish. Aquat. Sci. 70: 1699–1708.

Turnock, B. J. 2010. Eastern Bering Sea snow crab. Pages 31-124 *in* North Pacific Fishery Management Council. Stock assessment and fishery evaluation report for the king and tanner crab fisheries of the Bering Sea and Aleutian Islands regions. (available at: http://alaskafisheries.noaa.gov/npfmc/membership/plan_teams/CPT/CRABSAFE2010_910.pdf)